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REVIEWS.

Report of the Vermont State Geologist, 1901-1902. 190 pages ; 62 plates ; 2 maps.

THIS volume seems to mark, in a way, a fresh start in geological work in Vermont, made possible by more adequate provision for the work of the state geologist. The first thirty pages are devoted to a résumé of past geological work in the state, including (1) a sketch of the life of Zadock Thomson, state geologist 1853-56, together with a list of his publications ; (2) a list of reports on the geology of Vermont, 1845-1900, with a summary of the scope of each report ; (3) a list of other publications bearing on Vermont geology ; and (4) a biography of Mr. Augustus Wing (1808-76), an independent investigator who made important contributions to the knowledge of Vermont geology.

Then follows a summary of the metallic products, useful minerals, and building-stones of the state. Mr. George I. Finlay contributes the results of a study of the Barre Granite area, one of the most important granite areas in the country, the workshops at the Barre quarries being the largest of the kind in the world. A detailed petrographical description is given of the granites and their associated rocks.

"The Terranes of Orange County" are discussed by Dr. C. H. Richardson. The slates of Montpelier and Northfield, and those extending north and south from Bradford, which have been regarded as Cambrian, are placed by him in the same horizon with the "Calcareous Mica Schist" of Hitchcock, on stratigraphic grounds. The latter is separated by Richardson into a calcareous member, the Washington limestone, and a non-calcareous member, the Bradford schist. These have been regarded by most geologists as Silurian (Upper Silurian), but are placed by the author, together with the slates, in the Lower Trenton, on the ground of the lithological similarity of the slates with the graptolitic slates of Trenton age at Willard's Mill and Castle Brook, Quebec. The slates are shown to rest unconformably on the Huronian, and so the Cambrian, according to this classification, is absent. A more detailed statement and discussion of the evidence for this important change of correlation would be of interest. It may be noted that in accounting for the break in the outcrop of the slates near Bradford by erosion

(necessarily previous to the deposition of the Bradford schists), the writer presumes an erosion interval between the very beds (Washington limestone and the slate) which he classes together (see p. 78 and Plate XIV).

"The Geology of Grand Isle" is the subject of a chapter by Dr. Perkins. This is the largest of the islands of Lake Champlain. The term "Champlainian" is used instead of "Ordovician," and "Beekmantown" instead of "Calciferosus," upon grounds of priority. The much-folded and tilted Utica shales, resting on only slightly disturbed Trenton and Chazy beds, afford an excellent example of the different effects which the same orogenic movements may have on strata of different lithologic character and in different stratigraphic positions.

Peculiar concretion-like organic remains in the Chazy are believed to be sponges, and are placed by H. M. Seely in a new genus, *Stephocetus*. Four new species of this genus are described and figured. A petrographic description of the dikes of Grand Isle is given by H. W. Shirmer, of Columbia University.

The illustrations are numerous and especially good.

E. S. B.

Mineral Resources of the United States. Calendar Year 1901. By DAVID T. DAY. United States Geological Survey.

THE total value of our mineral production was \$1,086,529,521—a gain of 2.15 per cent. over that of 1900. For the second time it was more than a billion dollars. The twenty-two products whose value exceeded a million dollars each are, in order of their value, as follows: Coal, pig iron, copper, gold, silver (coining value), petroleum, stone (building), natural gas, lead, cement, brick clay, zinc, mineral waters, salt, phosphate rock, limestone (for iron flux), zinc white, clay (other than brick), aluminum, gypsum, quicksilver, and pyrite.

Coal.—The coal product of the United States for the year 1901 was the greatest in the history of the industry, its value being \$348,910,464—an increase of 14 per cent. The tonnage exceeded that of Great Britain and colonies, and was 75 per cent. greater than the output of Germany. The industry gave employment to 485,544 men. There were twenty-eight states and territories producing coal, and twenty-two of them show increased output, the greatest per cent. increase being that of North Dakota. Pennsylvania produced 51 per cent. of all the coal mined. Illinois ranked second with 9.6 per cent. West Virginia, Ohio, Alabama, Indiana, Kentucky, Colorado, and Iowa follow in the order named.